UNITED STATES DEPARTMENT OF AGRICULTURE

FARM PROGRAMS: INCOME BENEFITS AND
CAPITALIZATION INTO LAND VALUES

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CONTENTS

SUMMARY

This report presents estimates of the total benefits from
farm programs and of the capitalized value of the part of these
benefits attributed to land. It includes a discussion of the
conceptual problems of measuring benefits and of capitalizing
benefits into land values.

The total income benefit of farm programs in 1970 is estimated
at $6.9 billion. This includes direct payments of $3.7 billion.

The capitalized value of benefits is estimated to be $16.7 billion
or 7.9 percent of the value of farm real estate in 1970.

It is often assumed that nearly all of the benefits from farm pro-
grams are capitalized into land values and that this is at rates
similar to farm mortgage interest rates. Evidence here suggests
that only a third to a half of the total benefits accrue to land
and that the average capitalization rate is 1.5 to 3 times the
mortgage rate of interest.

The data show that program benefits are an important factor in
annual returns to labor and management. Plans to discontinue
major farm commodity programs and offset losses in asset values
through a buy-back system would need to take account of income
losses to factors other than land.

Since 1955, land buyers have paid an estimated $5.9 billion to
acquire the rights to program benefits. However, only $2.7
billion of this remained unrecovered in 1970.

FARM PROGRAMS: INCOME BENEFITS AND CAPITALIZATION INTO LAND VALUES

INTRODUCTION

Farm income in the United States is supported by the Federal government through a variety of programs. The indirect income supports include: financial incentives to limit the production of selected crops, the purchase, storage, and disposal of surplus production when it occurs and a wide range of export stimulants. In addition, farm income is supplemented directly through transfer payments.

It is frequently stated that these income benefits tend to become capitalized into values of farm real estate and that the real beneficiaries are the owners of land more than those who work it or provide the entrepreneurship and management.

This analysis was developed in response to a request from the Office of Management and Budget (OMB) to estimate income benefits from commodity programs and the extent of their capitalization into land values. The specific issues addressed include:

1. The effects of various commodity programs on farm commodity prices and on farm incomes.

2. The extent to which price and income effects of commodity programs have been capitalized.

3. The differences between commodities in the extent to which program benefits are capitalized.

4. The extent to which land owners have paid for the capitalized values of program payments in land purchases.

5. The extent to which nonprogram commodities and nonfarm
   opportunities affect the capitalization process.

This report, therefore, summarizes current information on program
benefits and on the process of capitalization of these benefits into
fixed assets. It discusses some of the conceptual problems involved
in measurement of the benefits, how they are distributed among the factor
of production, and how the residual to land or to allotments is capital-
ized into their values. It also delineates specific areas of research
that would improve current estimates.

The capitalization of benefits into the value of fixed assets
and the subsequent transfer of their ownership seriously complicates
the process of terminating or phasing out farm programs and moving to a
fully market-oriented economy. Unless more is known about the income
distributive effects of farm programs , it will be difficult or impossible
to compensate equitably those who lose. In sum, the study provides
guidance to:

   (a) determine how farm programs can be adjusted to serve the
       income distribution objectives of society; and

   (b) determine whom to compensate and how much if the farm
       commodity programs are terminated or phased out.

INCOME BENEFITS FROM PROGRAMS

A number of considerations are necessary in the measurement of the net effect of farm programs on farm income. These include the definition of an acceptable measure of benefits, the impact of programs on income from nonsupported commodities, and the effects of interactions between specific commodity programs.

In this report the total income benefit is defined as the difference between the 1970 actual net income of farm operators and an estimate of what the net income would have been in the absence of programs. This estimate reflects the income that would have been forthcoming if programs had been terminated at the beginning of the year and farm prices had been determined in a free market. An alternative measure of the income benefit would be the difference between the income stream under commodity programs and income after all long term adjustments to the program termination had been made. But the long term income concept would leave out the short term shocks of structural adjustments. The shock effects of program removal on those who would make the adjustments would not be included.

For a number of reasons, no attempt is made to provide income benefit estimates by commodities. Available data and aggregate income models do not provide a basis for the allocation of fixed expenses to the production of specific commodities. Returns to farm operations and to all enterprises are affected by the supply and price elasticities of other commodities. And these linkages are not well defined.

Then too, interrelationships between the feed and livestock sectors cause income from livestock to be higher with farm programs than without, because the programs tend to maintain high prices for feed grains by limiting the quantity available for livestock feeding. And as a result of the inelastic demand for meat, a smaller supply of meat produces a large total income to livestock producers than they would have in the absence of crop price support programs. Thus, in the long run, a movement to a free market would likely result in an income reduction in the livestock sector despite a probable shrinkage in imports.

Nonsupported commodities are also affected and any income lost from these enterprises would need to be allocated to specific programs. Because farm commodities are not produced in isolation from each other, the income effects become inseparable without a thoroughly complex and costly study of the market forces affecting each farm commodity and all of the factors of production involved. Assumption about these parameters would leave any estimate in serious doubt with the present state of knowledge about the farm economy.

None the less, we believe that the aggregate income effect shown in this report is a reasonable estimate of the total impact of programs on income and can be useful for answering some of the basic questions related to phasing out farm programs. This estimate is well above the upper boundary of the amount that has been capitalized.

Estimated Benefits

The total short-term income effect of the 1970 farm price support and acreage control programs is estimated at $6.9 billion. This includes direct payments of $3.7 billion and indirect price support benefits of $3.2 billion. The $6.9 billion total benefit is the difference between the actual net income of $15.9 billion in 1970 and the estimated short-term free market income of $9.0 billion (table 1). [1]/

Farm operators tend to base their price expectations on previous prices. Thus, output would probably increase in the first year of a no-program situation as some 60 million acres now being set-aside are returned to production. With this boost in production prices would fall well below those received under the program. Since the demand for the supported commodity is fairly inelastic, prices would decline more rapidly than quantity increases and the initial impact on gross receipts would be severe (5).

Prices in the first year are expected to decline severely (table 2). Most crop prices would be about 50 or 60 percent of their 1970 levels. This implies 70-cent corn, $1.10-soybeans and 85-cent wheat. Livestock prices, however, would not likely decline more than 10 percent.

These price declines would lead to a series of adjustments as high cost producers, previously protected under the program, reduced production. Many of the resources used by them have low salvage values and would, therefore, tend to remain employed in production so long as the operators

1/ Data in Table 1 are revisions of estimates given in CAED Report 32 (5) to reflect 1970 conditions.

Table 1.--Farm income by source, farm production expenses and net farm income, actual 1966-70 and 1970 projected 1970 estimates under a free market after short and long-term adjustments

	Actual 1/		Projected 1970 2/	
	1966-70	1970	Short-term adjustment	Long-term adjustment
	(Million dollars)			
Crop receipts---------:	18,918	19,636	15,522	17,453
Wheat---------------:	1,744	1,560	1,217	1,758
Feed grains--------:	2,543	2,789	1,175	1,858
Cotton-------------:	1,324	1,267	1,872	1,826
tobacco------------:	1,292	1,388	1,270	1,270
Vegetables---------:	2,738	2,825	2,697	2,697
Fruits-------------:	1,991	2,088	1,686	1,686
Other--------------:	2,866	3,012	3,310	3,310
Livestock receipts----:	26,572	29,595	28,280	22,609
Meat animals--------:	16,180	18,497	18,059	12,619
Dairy--------------:	5,992	6,523	5,512	5,512
Poultry and eggs----:	4,069	4,303	4,384	4,153
Other--------------:	331	272	325	325
Government payment----:	3,466	3,717	401	401
Wheat---------------:	777	871	0	0
Feed grains--------:	1,334	1,504	0	0
Cotton-------------:	848	919	0	0
Other 3/-----------:	507	423	401	401
Total cash receipts---:	48,956	52,948	44,203	40,463
Cash expenses 4/----:	30,623	33,949	32,337	27,900
Net cash receipts-----:	18,333	18,999	11,866	12,563
Depreciation-------:	6,166	6,918	6,700	6,400
Actual cash income -:	12,167	12,081	5,166	6,163
Farm perquisites 5/-:	3,383	3,632	3,632	3,632
Inventory change----:	207	226	226	226
Net farm income-------:	15,757	15,939	9,024	10,021

1/ Income data for 1966-70 and 1970 are from U.S. Department of Agriculture, FIS-218, July 1971.

2/ Income estimate for projected 1970 from CAED Report No. 32, Table 5, p. 34. 'Iowa State Univ., Ames, Oct. 1968. Basic expense item estimates from same source and adjustments made to reflect rising farm input prices.

3/ Conservation, wool and sugar programs.

4/ Cash expenses are current operating expenses plus taxes, interest and landlord rent.

5/ Value of home consumption and gross rental value of farm dwelling.

covered variable costs. Adjustments would occur only as the returns to resources employed in agriculture fell below returns from employment elsewhere and to the degree that the resources are mobile. For many, this could mean a long period of employment at subsistence level returns.

As adjustments are completed, commodity prices will gradually drift upward but would not be expected to reach their 1970 levels. Wheat prices would be in the viscinity of $1.20 per bushel, corn close to $1.00 per bushel and soybeans less than $2.00 per bushel -- in general, about 10 to 30 percent below the 1970 levels, which were by and large exceptionally good.

The $9.0 billion income to farm operators in the first year of a free market implies that high cost producers would have negative returns (losses) from farm production. Only a few of these would immediately leave the production sector, because of the capability of farm firms to withstand short-term losses. However, this high cost group would eventually be forced out of production.

Large quantities of land would not be expected to come on the market at once, but for that which did, prices would decline in areas strongly affected by production control programs.

The long-run adjustment model suggests that crop prices are expected to rise modestly from the short-run level (table 2). On the other hand, livestock prices and income would fall as output expanded in response to the reduced cost of grain and as additional land shifted from crop to livestock production.

Table 2.--Season average farm prices: Actual 1966-70 and projected
1970 with short and long term adjustments to a free market

| Commodity | Unit | Actual prices 1/ | | Projected 1970 2/ | |
		1966-70	1970	Short-run adjustment	Long-run adjustment
		----------------Crop prices---------------------			
Wheat--------------	$/bu.	1.37	1.36	.85	1.22
Corn--------------	$/bu.	1.17	1.34	.70	.98
Oats-------------	$/bu.	.63	.63	.38	.53
Barley-----------	$/bu.	.95	.92	.57	.80
Grain sorghum-----	$/bu.	1.03	1.13	.60	.84
Soybeans----------	$/bu.	2.57	2.84	1.08	1.86
Cotton lint-------	¢/lb.	22.4	22.5	26.6	23.2
		----------------Livestock prices--------------------			
All cattle--------	¢/lb.	24.2	27.1	26.5	17.6
Hogs--------------	¢/lb.	21.0	22.7	22.0	15.8
Sheep-------------	¢/lb.	20.8	22.1	19.5	19.1
Broilers----------	¢/lb.	14.3	13.5	15.3	15.3
Turkeys-----------	¢/lb.	21.7	22.7	22.5	22.5
Eggs-------------	¢/doz.	36.4	37.6	35.4	35.4
Milk-------------	$/cwt.	5.25	5.68	4.52	4.52

1/ Actual prices from U.S. Dept. Agr., Agricultural Statistics, 1971,
and Livestock and Meat Statistics, Supplement for 1970 to U.S. Dept. Agr.
Statis. Bul. 333, June 1971.
2/ Projected prices from CAED Report No. 32, table 4, p. 33. Iowa
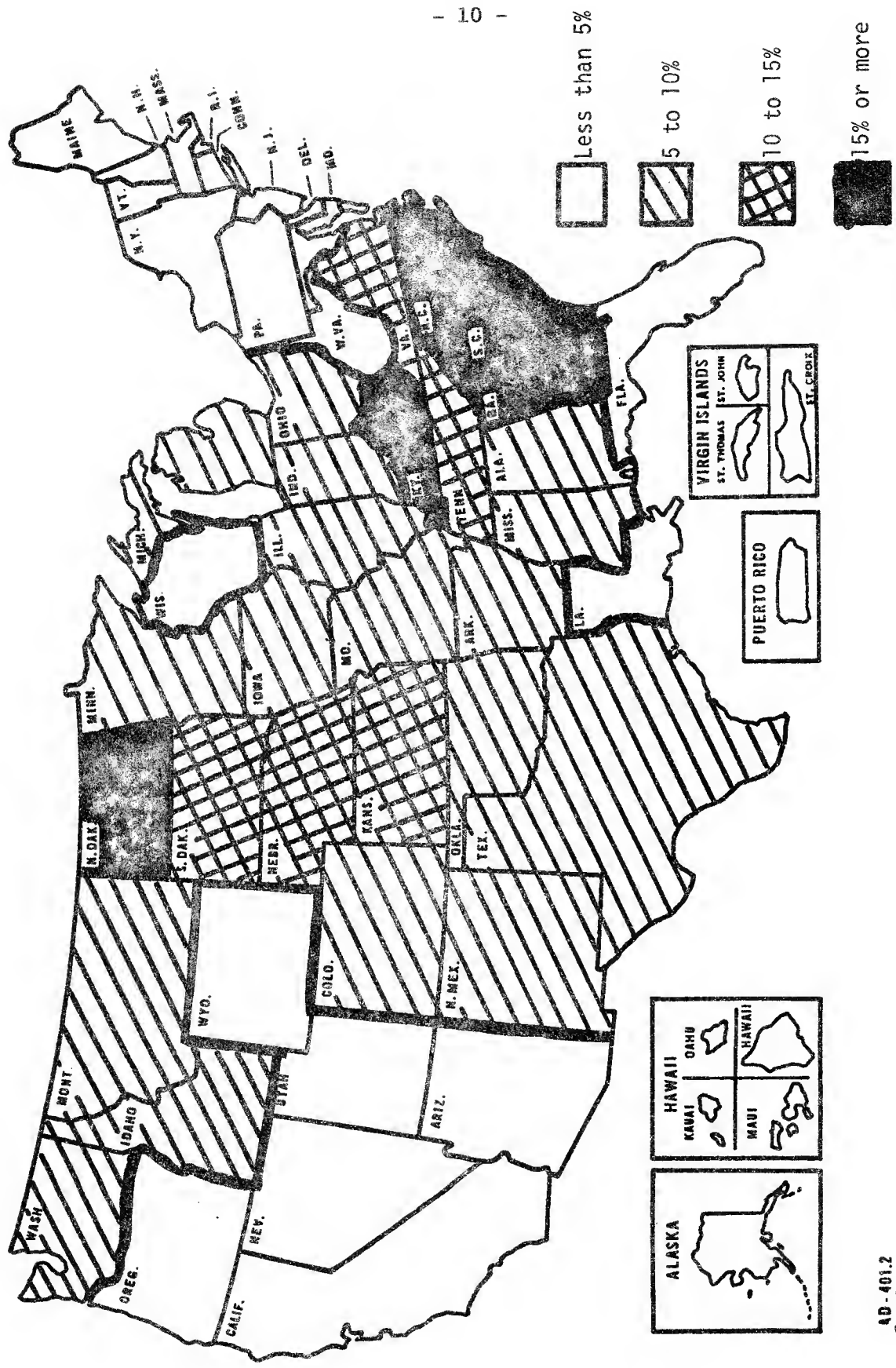State University, Ames, Iowa. October 1968.

The long term model shows a rise in income from the short run level. Moreover, this higher income could well be distributed among a reduced number of larger farms with an uncertain impact on average farm income or its distribution.

The impact of program removal would be most serious in areas where (1) sales of the supported commodities make up a large part of the agricultural income, (2) agriculture is the main source of employment, and (3) average production costs are high relative to the anticipated free market prices for commodities grown (Chart I).

CAPITALIZED VALUES

The process by which program benefits are capitalized is the same for each commodity, yet the extent of capitalization may be quite different. That is, for any capitalization to occur some increment of income must be available as income (rent) to land or allotments. The sources of income may come from diversion payments, marketing certificates, or indirect transfer from consumers through higher prices. Although a dollar of income from any source would have some effect on the value of land,

Chart I - Capitalized Value of Farm Programs as a Percent of
Current Real Estate Value, 1970

Less than 5%

5 to 10%

10 to 15%

15% or more

VIRGIN ISLANDS

ST. THOMAS | ST. JOHN

ST. CROIX

PUERTO RICO

HAWAII

OAHU

KAUAI

MAUI

HAWAII

ALASKA

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producer's expectations with regard to the certainty and stability of the income source will be different and will affect directly the discount rates used to capitalize income. Differences in programs with respect to the ability of individuals to acquire or dispose of allotments or production rights may also cause substantial differences in their expectations regarding future income.

The following section provides empirical evidence of the value of allotments and the differences in capitalized values and capitalization rates for rice, cotton, peanuts, and tobacco.

Estimates of capitalized values for wheat and feed grains are based on capitalization rates for cotton. In these estimates it is assumed that direct payments are a suitable proxy for land returns form the program.

Cotton

Data from the 1966 Cotton Cost Survey show that allotment buyers were willing to purchase cotton allotments at rates ranging from $.12 to $.27 per pound by States (table 3). For the same period lease rates for cotton allotments ranged from $.03 to $.06 per pound. Rent-to-value ratios (implied discount rates) for allotments ranged from .17 to .40, substantially above the market rate of interest for mortgages. For the United States, capitalization rates averaged 21 percent. These data support

Table 3.--Cotton allotments: Prices, rents, and implied capitalization rates
selected States, 1966

State	Purchases		Rentals		Implied capitalization rate
	Observations	Price per pound	Observations	Price per pound	
		Dollars		Dollars	
North Carolina	10	.12	14	.04	.33
South Carolina	5	.15	25	.06	.40
Georgia	25	.12	43	.03	.25
Alabama	32	.18	101	.04	.22
Tennessee	4	.27	24	.05	.19
Mississippi	7	.23	52	.05	.22
Arkansas	19	.22	35	.05	.23
Louisiana	3	.20	3	.04	.20
Oklahoma	2	.13	6	.04	.31
Texas	49	.23	159	.04	.17
New Mexico	1	.24	6	.06	.25
Arizona	1	.25	19	.06	.25
California	13	.26	40	.05	.19

Source: Unpublished data from 1966 Cotton Cost Survey, Economic Research
Service.

Table 4.--Cotton: Allotment values and rents, and direct payments,
selected States, 1970

| State | Allotments | | | | | Direct payments 4/ |
	Acreage 1/	Value per acre 2/	Total value	Rent per acre 3/	Total rent	
	Acres	Dollars	1,000 dollars	Dollars	1,000 dollars	1,000 dollars
Illinois-------------:	2,871	44.28	127	14.76	41	------
Missouri------------:	380,295	136.85	52,043	29.75	11,314	22.449
Kansas--------------:	51	30,81	------	9.48	------	------
Virginia------------:	17,112	44.28	758	14.76	253	432
North Carolina------:	469,240	44.28	20,778	14.76	6,926	14,451
Kentucky------------:	7,295	44.28	323	14.76	108	465
Tennessee-----------:	569,489	142.83	81,340	26.45	15,063	34,854
South Carolina------:	688,519	54.75	37,696	21.90	15,079	32,819
Georgia-------------:	817,929	46.68	38,181	11.67	9,545	37,503
Florida-------------:	33,924	46.68	1,584	11.67	395	1,088
Alabama-------------:	965,800	84.24	81,359	19.12	18,466	49,296
Mississippi---------:	1,596,829	136.85	218,526	29.75	47,506	122,623
Arkansas------------:	1,378,146	110.22	151,899	25.05	34,523	79,578
Louisiana-----------:	569,983	110.60	63,040	22.12	12,608	40,410
Oklahoma------------:	755,601	30.81	23,280	9.48	7,163	24,317
Texas---------------:	6,857,326	68.31	468,523	11.88	81,465	308,488
New Mexico----------:	181,185	117.60	21,307	29.40	5,327	14,425
Arizona-------------:	344,632	224.00	77,198	53.76	18,527	44,403
Nevada--------------:	3,637	117.60	428	29.40	107	346
California----------:	774,376	213.72	165,498	41.10	31,826	89,922
United States-------:	-------	------	1,503,788	-----	316,243	919,002

1/ Acreage allotments in 1970.
2/ 1966 Cotton Cost Survey data on value per pound and 1969-71 average harvested yield, based on harvested yield.
3/ 1966 Cotton Cost Survey data on rent per pound and 1969-71 average harvested yield, based on harvested yield.
4/ Direct payments in 1970.

Peanuts

Data from a 1968 survey, made to obtain the value of peanut allotments, show a national average capitalization rate of 12.5 percent compared with 21 percent for cotton (table 5) (6). Apparently the program benefits are more certain and peanut producers are more confident that they will be continued. No comparison can be made with direct payments but the rental income (cost) from the program would be about $75.3 million if all allotments were rented at the indicated rates.

Rice

Although data on rice allotment values are scanty, a California study shows capitalization rates of about 11 percent (2,4). The rice program has, in general, been about as stable as the peanut program and the capitalization rates implied are similar (table 6).

Since 1962, the rice program has been essentially unchanged except for variations in allotment levels. A unique characteristic of the program is that in Texas, California, and parts of Louisiana allotments can be transferred separately from land. In other States the allotments are tied to specific tracts. Thus, although allotments have a value in and of themselves, land values should be relatively unaffected by the program in producer allotment States. However, when allotments have been purchased they assume a real value to the owner and he would suffer a substantial capital loss if the program was discontinued.

Table 5.--Peanut allotments: Values and rents per pound, per acre, ratios of rent to value, and total values and rents, 1970

State	Acres 1/	Yield per acre 1/	Price per pound 2/	Rent per pound 2/	Value per acre	Rent per acre	Ratio of rent to value	Total value	Total rent
	Acres	Pounds	Dollars	Dollars	Dollars	Dollars		1,000 dollars	1,000 dollars
Missouri------------	247	2,670	0.20	0.028	534	74.76	.14	132	18
Virginia-----------	104,929	3,060	.20	.028	612	85.68	.14	64,217	8,990
North Carolina------	167,975	2,670	.28	.026	748	69.42	.09	125,645	11,661
Tennessee----------	3,614	1,880	.11	.012	207	22.56	.11	748	82
South Carolina------	13,909	1,880	.054	.012	102	22.56	.22	1,419	314
Georgia------------	529,744	2,220	.18	.024	400	53.28	.12	211,898	28,224
Florida------------	55,535	2,075	.14	.022	291	45.65	.16	16,161	2,535
Alabama------------	216,962	1,660	.11	.012	183	19.92	.11	39,704	4,329
Mississippi--------	7,501	1,100	.11	.012	121	13.20	.11	908	99
Arkansas-----------	4,188	1,100	.11	.012	121	13.20	.11	507	55
Louisiana----------	1,947	1,100	.11	.012	121	13.20	.11	236	26
Oklahoma-----------	138,427	1,655	.15	.025	248	41.38	.17	34,330	5,728
Texas--------------	357,885	1,405	.20	.025	281	35.12	.12	100,566	12,569
New Mexico---------	8,333	2,230	.20	.030	446	66.90	.15	3,717	557
Arizona------------	762	2,230	.15	.025	334	55.75	.17	255	42
California---------	931	2,230	.15	.025	334	55.75	.17	311	51
United States------								600,754	75,280

1/ Acreage allotments and yields in 1970.
2/ Prices and rents developed from Schools, Russell C.

Tobacco

Tobacco allotments have not been transferable by sale but can be leased within counties.

Allotment values for tobacco have been estimated to be $3,000 per acre. This estimate is the difference between the value of land with and without a tobacco allotment (table 7) (1,7).

MVP's (marginal value products) for allotments have also been estimated through linear programming and compared with estimated market values. These estimates imply capitalization rates of 12 percent or more depending on the time period for the study and the techniques used.

Some evidence suggest that capitalization rates for tobacco have been declining over time. However, they are still high in relation to market interest rates for money.

Wheat and Feed Grains

Market estimates of capitalized values for wheat and feed grains, are not available. However, benefits under the wheat and feed grain programs may be capitalized at rates close to those for cotton because all three programs have about the same year-to-year stability.

Direct payments under the wheat and feed grain programs capitalized at 21 percent (the average rate for cotton) give estimates of about $4.1 billion for wheat and $7.2 billion for feed grains.

Table 7.--Tobacco allotments: Acreage and
value, selected States, 1970

State	Acreage	Value per acre 1/	Total value
	Acres	Dollars	1,000 dollars
New York---------:	7	3,000	21
Pennsylvania------:	120	3,000	360
Minnesota---------:	112	3,000	336
Ohio-------------:	8,596	3,000	25,788
Indiana----------:	14,536	3,000	43,680
Illinois---------:	3	3,000	9
Iowa-------------:	7	3,000	21
Missouri---------:	2,390	3,000	7,170
Kansas-----------:	56	3,000	168
Virginia---------:	80,737	3,000	242,222
West Virginia-----:	2,253	3,000	6,759
North Carolina----:	389,211	3,000	1,167,633
Kentucky---------:	168,255	3,000	504,765
Tennessee--------:	65,941	3,000	197,823
South Carolina----:	67,164	3,000	201,823
Georgia----------:	58,963	3,000	176,889
Florida----------:	12,319	3,000	36,957
Alabama----------:	584	3,000	1,752
Arkansas---------:	35	3,000	105
Total----------:	871,289	----	2,614,281

1/Allotment values estimated for flue-cured tobacco
in North Carolina used for all types of tobacco.

Such a procedure assumes that direct payments represent the equivalent of total returns to land from both the indirect benefits obtained through the market place and the direct payments. Thus, it may be low. On the other hand, it may be too high considering that there are claimants other than land for the direct payments (3).

The estimate may be high for another reason. In a speech before the Senate Appropriation Sub-Committee on June 4, 1969, Secretary Hardin provided data which suggest that approximately 89 percent of the direct payments to feed grain producers in 1968 were for resource adjustment and only 11 percent represented an income supplement. 2/ For wheat producers, 51 percent of the payments was for resource adjustment and 49 percent was for income supplement, compared with 35 and 65 percent for cotton. In effect, the direct payment was only in part a net addition to income. A substantial part was to compensate producers for income foregone on the acreage they withheld from production.

The portion of the direct payment which compensates for income foregone would have only a modest impact on land values through the price action. The income transfer portion would, on the other hand, be available for partitioning among land, labor, and capital. If only the income transfer portion were used as a measure of the land return, the capitalized values for wheat would be cut in two

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2/ Resource adjustment is a payment in lieu of production.

and values for feed grains would be reduced to 11 percent of
the estimate shown in this report. However, such a procedure
would assume that only the income supplement from direct payments
is available to land and that none of the unmeasured indirect
benefits are capitalized. Thus, estimates based on only the
income part of the direct payments probably set the lower range
of capitalized value for the two programs.

A true capitalized value for wheat and feed grains probably
would lie between the estimate based on total direct payments
and the estimate based on the direct income supplement.

As wheat allotments and feed grain bases are not transferable,
no values of these allotments or bases separate from land values
are observable. Theoretically, one could observe differences in
land values for similar farms with different sizes of allotments
as has been done with tobacco. However, after years of adjustment
by ASCS Committees, the variance is not likely to be large and that
which is could well be caused by a multiplicity of other factors,
including the superior influence of other crops that may be
important determinants of land values.

The current wheat and feed grain set-aside programs contain features that would make a given allotment or base take on different values to different producers. Under the current programs, there are two main types of benefits of the programs; direct payments in the form of wheat certificates and set-aside payments, and loan rates or supported market prices.

The flexibilities of these programs permit production of wheat or feed grain on many more acres than just the allotment acres. All production is eligible for the price support once the minimum set-aside provision is met. Hence, the first increment of wheat allotment or feed grain base is worth much more to a producer than second or later increments.

Before the set-aside program, participation rates in the feed grain programs were low as compared with such rates in other programs. In some States and in some years, only one-half to two-thirds of the eligible feed grain acreage was in the feed grain program. However, this does not mean that nonparticipating producers did not benefit from the feed grain program. Producers who did not participate in diversion could still gain the benefits of a stabilized and supported market price. In fact, they may have gained more through price support benefits and production reduction of participants by not participating than if they had participated and received the direct payment benefits.

These facts point up the difficulty of determining capitalized values of allotments or the benefits received by various production factors.

Benefits to Producers of Nonallotment or Nonsupported Crops

There are a number of nonallotment crops for which CCC loan rates have been established. These include oats, flax, soybeans, and some others. For these crops, no direct payments are available but prices are supported through CCC loans. Hence, producers of these crops obtain benefits from the program even though they have no allotments. If any benefits are capitalized into asset values such values accure to the land or to other factors but are not measurable in terms of value for allotments.

There are numerous other agricultural commodities for which no loan rates are available but the prices of which are obviously affected by the total commodity program system. Prices of livestock are significantly affected by the price support systems, although no direct support prices apply to livestock. It is likely that some portion of the benefits thus derived are capitalized into rangeland values.

Total Capitalized Value of Programs

By adding together the various estimates for commodities, the capitalized value of the benefits associated with the land resources is estimated at $16.5 billion or about 7.9 percent of the value of all farm real estate in 1970 (Table 8)

If all of the net income benefits ($6.9 billion) from farm programs were available for capitalization into land values and this income were capitalized at 15 percent (the lower range or capitalization rates shown for cotton), the capitalized value of the 1970 income benefits would be $46.0 billion -- about 22 percent of the value of farm real estate in that year. This can be viewed as well above an upper limit on the capitalized value of farm program benefits since land is not the only claimant to program benefits. These two estimates suggest that only about one third of the commodity program benefits are capitalized into land; the remainder is allocated to other resources namely labor, management and capital.

ALLOTMENT PURCHASES

The analysis thus far is of the opportunity value of the benefits from the 1970 programs. 3/ We have not discussed, as yet, what farmers actually paid to acquire program benefits over time. However, this is essential in order to understand the program payment problem, for only a small part of the total opportunity value was actually purchased.

3/ Opportunity value is defined as the value of benefit determined as though all investment decisions were made at the beginning of 1970.

Table 8.--Capitalized values of farm program benefits United States, 1970 1/

Region	Cotton 2/	Tobacco 3/	Peanuts 4/	Rice 5/	Wheat 6/	Feed grain 6/	Total All listed programs	As a percentage of real estate value Percent
				--1,000 dollars--				
Northeast-----		381			75,300	147,533	223,214	2.04
Lake States-----		336			173,519	928,663	1,102,518	7.21
Corn Belt-----	52,170	76,668	132	1,274	444,519	2,790,105	3,364,868	6.96
Northern Plains---		168			1,703,471	1,357,352	3,060,991	13.78
Appalachian---	103,199	2,119,202	190,610	148	57,604	492,104	2,962,867	19.39
Southeast-----	158,820	417,421	269,182	1,014	23,081	359,833	1,229,351	9.02
Delta States-----	433,465	105	1,651	245,508	9,543	89,624	776,896	6.11
Southern Plains-----	491,703		134,896	112,650	602,076	720,333	2,061,658	7.73
Mountain-----	98,933		3,972	61	717,872	213,256	1,034,094	6.23
Pacific-----	165,498		311	133,222	342,853	65,453	707,337	2.67
United States-----	1,503,788	2,614,281	600,754	493,877	4,149,838	7,161,256	16,523,794	7.94

1/ State data shown in Appendix I.
2/ Based on estimates from 1966 cotton cost survey data on transfer prices per pound of allotment.
3/ Per acre values estimated at $3,000 see Bradford and Thompson (1).
4/ Based on Schools (6).
5/ Based on Grant and Hottel (4).
6/ Direct payments capitalized at 21 percent, the average rate for cotton.

Table 9.--Values of land transferred, values of benefits
purchased and unrecovered values in 1970 1/

Year	Value of land transferred	Value of benefits purchased	Value of benefits remaining in 1970
		Million dollars	
1955------:	3,970	314	39
1956------:	4,349	344	49
1957------:	4,299	340	55
1958------:	4,375	345	65
1959------:	4,580	362	78
1960------:	4,516	357	95
1961------:	4,296	339	96
1962------:	4,527	358	117
1963------:	4,503	356	134
1964------:	4,843	383	166
1965------:	4,845	383	191
1966------:	5,207	411	235
1967------:	5,366	424	279
1968------:	5,370	424	321
1969------:	5,180	409	356
1970------:	5,264	415	415
Total---:		5,964	2,691

1/ Capitalized values in each year are assumed equal to 7.9
percent of the value of farm real estate as estimated for 1970.
These values are discounted at 15 percent. This rate was chosen
because it lies between the average rate for cotton and the
average rate for peanuts, rice and tobacco.

This can be demonstrated as follows: Each year $4 billion to $5 billion are spent for real estate purchases and these purchases represent about 2 percent of the land in farms (table 9). Some part of this expenditure is for the rights to the benefits from programs. If we can assume that programs have never represented more of the total value of real estate than in 1970, we can estimate the upper limit of what was paid to acquire benefits by taking 7.9 percent of the value of land transferred in any one year (the percentage estimated for 1970) and summing over the years of purchase. If the true capitalization rate for benefits is 15 percent or higher, a land buyer would have recovered 90 percent or more of what he paid in 15 years or less. Thus, those who purchased benefits more than 15 years ago (before 1955) have, for all practical purposes, recovered their investment. Because of the appreciation in asset value that has occurred, they are, in fact, receiving a windfall stream of income.

Those who purchased land since 1955 may incur substantial losses, if programs are removed and the closer we draw to the present the greater the potential actual loss.

However, if we sum all of the unrecovered investment since 1955, it amounts to only $2.7 billion dollars or slightly less than one year's direct payments to program recipients. This $2.7 billion represents the actual dollars of investment that were paid for benefits but are as yet unrecovered.

The difference between the $16.5 billion opportunity value shown in table 10 and the $2.7 billion unrecovered investment represents windfall gains.

THE MODEL

The Capitalization Process

The capitalization process assumes that buyers of an asset
have evaluated the stream of earnings that will accrue to an asset
over time and that they will pay no more than the expected value
of this income stream discounted to the present. Buyers are also
assumed to partition returns among factors of production according
to the market forces -- supply and demand -- for each.

Land buyers, in any year, would therefore estimate the expected
income flow from land and discount to a present value. This income
flow might include a factor for satisfaction or a factor for the
capital gains income received in the last year of ownership as well
as production income.

If the income flow is expected to be fairly even and certain,
the problem of discounting can be reduced to a rather simple
formula. However, if a great deal of uncertainly is associated
with the expectation and the flow is irregular the discounting
problem is more complex.

The capitalization process can be summarized by the formula

$$(1) \quad V = \sum_{t=1}^{n} \frac{a_t}{(1+r_t)n}$$

Where V = the present value
    n = the time horizon
    t = the year within the horizon
    a_t = the annual income in year t
    r_t = the discount rate in year t

If a_t and r_t are constant and known with certainty, the formula reduces to (2) $V = \dfrac{a}{r}$ for an infinite time horizon. And, for all practical purposes, any horizon over 30 years can be assumed to be infinity.

However, if a and r are increasing, decreasing or irregular, but known with certainty, the formula must be as in (1).

If we introduce the concept of expectations, then the formula becomes (3) $V = \sum\limits_{t=1}^{n} \dfrac{E(a_t)}{(1 + E(r_t)_n}$

Where $E(a_t)$ = the expected value of a_t
$E(r_t)$ = the expected value of r_t

In this framework, we are concerned with the stream of future returns and discount rates that might be valid in the future. Because these are unknown we tend to base our expectation on past experience and project this experience into the future. Thus, we infer that $\dfrac{a_{(t-1)} + \ldots + a_{(t-m)}}{m}$ is a suitable proxy for $E(a_t)$. A similar assumption is made with respect to $E(r_t)$ and the problem then is one of determining the validity or certainty of the assumption.

The value of (a_t) is derived from the interplay of economic forces which determine the allocation of any income or program benefits among the factors of production. The primary determinants are the price-quantity relationships for both inputs and outputs, nonprogram production alternatives, and nonfarm alternatives for the assets employed. If all factors had equal supply elasticities and were used in fixed proportions, each would receive its proportional share of income either with or without programs. On the other hand, if supplies of all inputs, except land were perfectly elastic

and the land supply perfectly inelastic, all program benefits
would be available for land. Neither of these extremes is very
likely, and program benefits will be shared by the several input
factors in some intermediate proportions. Land will receive
some part, but it may be a lesser part of the total.

If the quantity of land available for a particular commodity
is reduced land becomes a more limiting factor in the production
process and the MVP of land increases relative to that of labor
and capital--which become underemployed. If there are few alternatives
for labor and capital, so that their salvage values are very low,
it is rational for the operator to acquire more land in order to
fully employ these resources. In the process, the increased
revenue from the program is bid into land prices. However, if
there are good nonfarm alternatives for the underemployed factors,
the extent of capitalization will be reduced because an individual
may add more to his income by part-time nonfarm employment than
by acquiring additional land.

In the southern part of Michigan, for example, there is ample
opportunity to find nonfarm employment within easy commuting distance
of the farm home. In such an area, farming may tend to become a
part-time occupation and few of the program benefits become capitalized
into land. On the other hand, nonfarm opoortunities in North Dakota
are relatively scarce and salvage values for farm operator labor tend
to be low. Thus, to maintain income and fully employ labor and capital,
land prices are bid up with more of the program benefits capitalized
into land values (Appendix 1).

For those commodities where share rental is an important factor, price increases and certificate payments are shared along with the crop (see appendix 2). Thus some portion of the direct and indirect benefits go to the tenant rather than the landlord. In addition some part of the benefits are used to cover variable costs by the less efficient producers. In the absence of programs these individuals would stop producing because annual incomes would not cover variable costs for these commodities.

For example, variable production costs for cotton averaged $0.25 per pound in 1969 (6). If cotton prices fell below this level--which they would be expected to do in a free market--a large number of producers would be forced to discontinue production. Only the returns over variable costs would be available for the fixed factors and only some smaller fraction of that return would be available for land because it is not the only fixed factor.

Annual returns to land from programs can thus be viewed as a single factor in a general equilibrium framework where all factors' returns are simultaneously determined.

Variables in the Model

Annual Earnings. The major method of determining annual earnings available for capitalization is the lease rate for allotments. Annual rents reflect the best judgment of operators and allotment owners of the contribution of the program to income. Currently, however, allotments can be rented only within limited geographic areas. Thus, the annual rents might be lower than if allotments were freely rented across county and State lines. In addition, annual rates will reflect the increment to earnings above returns from other crops with other programs in effect. These returns to other crops would be higher than in a free market situation. Thus, the rental rate for a single commodity allotment will be reduced.

An alternative to market values is to use residual estimates of returns to allotments, but this method seems unlikely to provide useful information. The major problem in making residual estimated is the partitioning of returns to land, labor, capital, and allotments. The partitioning process seems to misrepresent the way the farm operator views his returns. Because land, labor, and capital in general are controlled or owned by one individual farm producer, he is concerned with the aggregate returns to the bundle of factors versus the aggregate return to these factors in some other use. His decisions are based on the flow of income in total and not on the separate returns from each asset; however, in the long run, he is forced to make the allocative decision by deciding how much to pay for the factors of production including his own labor.

Time Horizon. In most studies of the capitalized value of allot-
ments and in most references to the capitalization process, researchers
have assumed a horizon of infinity. The formula is easy to
use and the available data do not usually lend themselves to
more complex formulations. However, the use of this simple
framework has tended to limit thinking concerning capitalization.

First, it generally assumes that program benefits will be
the same in every year and that buyers in any future year would
pay the same price for program benefits as buyers today. Second,
it generally assumes no recovery of investment except at the
termination of ownership. Also, it frequently assumes that
benefits from the program are lost to later purchasers for all
time.

In reality, allotment buyers are likely to have time horizons
of less than 30 years. In fact, with the uncertainty surrounding
programs, they may be unwilling to consider allotment returns
as an income factor for a period of more than ten to fifteen
years. Sometimes the period may be as short as 3 or 4 years,
if significant changes are occurring in the program.

The shortness of the time horizon is reflected in the capitali-
zation rates implied by the annual program rents and market values
for allotments. The higher the implied capitalization rate,
the less the weight given to future earnings. For example, assuming
a capitalization rate of 25 percent, we could recover about 95
percent of the value in 15 years. At a capitalization rate of
5 percent, we recover only 52.6 percent of the investment in 15

years. Not only is the perpetuity value higher with a lower discount rate, but the recovery period is longer. If the recovery period is fixed, then the capitalized value is reduced to the level specified by the time horizon.

Raising the capitalization rate not only lowers the discounted value of the income stream but shortens the recovery period substantially. Thus, although an individual may assume that programs may continue over a long period, he may be unwilling to risk much on this assumption.

Fox example, an individual who believes there is a low degree of risk may capitalize program benefits at a 5-percent rate of return. If this is done for a period of 15 years, an income of $50 15 years from now is still worth $25.00 today (table 10). However, at a rate of 25 percent it is only worth $1.50.

Discount Rates. The only method available for estimating discount rates from market data is by comparing sales prices and lease rates for allotments. We have such observations for cotton, peanuts, and rice.

In a few cases, discount rates have been estimated by using
regression techniques to arrive at the market value of an acre of
allotment and by using other data to determine the added income
from an additional acre of allotment. Comparisons of incomes
and values have been used to develop ranges for capitalization
rates for varying sizes of firms.

If we can accept the idea that programs have a fairly high
uncertainty factor and may, therefore, have a short time horizon
and a high discount rate, we can set up a hypothetical model that
will provide additional information on program benefits. For
example, in the first year of a three-year program, the land buyer
knows that the program will continue for three years and this
income may be discounted at the same rate as other farm income.
More uncertainty is present with the second three years and still
more with more distant years and programs.

It seems logical then to establish a framework for discounting
program benefits that incorporates this knowledge. We might start
with the mortgage rate of interest as the discount rate for the
first three years. For each succeeding three-year period an
additional 3 to 5 percent is added to the original rate. Once
the time horizon and discount rate for each period have been
estimated it is possible to convert such a system to a perpetuity
income stream in order to compare it with market observations.

Table 10.--Annual rent of 50 capitalized at 5, 15, and 25 percent with
cumulated recovery and percentage recovery, by years

Year	Discount rate								
	5 percent			15 percent			25 percent		
	Present value	Cumulated present value		Present value	Cumulated present value		Present value	Cumulated present value	
	Dollars	Dollars	Pct.	Dollars	Dollars	Pct.	Dollars	Dollars	Pct.
1-----:	47.50	47.50	4.75	43.00	43.00	12.91	40.00	40.00	20.00
2-----:	45.00	92.50	9.25	37.50	80.50	24.18	32.00	72.00	36.00
3-----:	43.00	135.50	13.55	33.00	113.50	34.08	25.50	97.50	48.75
4-----:	41.50	177.50	17.70	28.50	142.00	42.64	20.50	118.00	59.00
5-----:	39.50	216.50	21.65	25.00	167.00	50.15	16.50	134.50	67.25
6-----:	37.50	254.00	25.40	22.00	189.00	56.76	13.00	147.50	73.75
7-----:	36.00	290.00	29.00	19.00	208.00	62.46	10.50	158.00	79.00
8-----:	34.50	324.50	32.45	16.50	224.50	67.42	8.00	166.00	83.00
9-----:	33.00	357.50	35.75	14.00	238.50	71.62	6.50	172.50	86.25
10-----:	31.50	389.00	38.90	12.50	251.00	75.38	5.00	177.50	88.75
11-----:	30.00	419.00	41.90	10.50	261.50	78.53	4.00	181.50	90.75
12-----:	28.50	447.50	44.75	9.50	271.00	81.38	3.00	184.50	92.25
13-----:	27.50	475.00	47.50	8.00	279.00	83.78	2.50	187.00	93.50
14-----:	26.00	501.00	50.10	7.00	286.00	85.89	2.00	189.00	94.50
15-----:	25.00	526.00	52.60	6.00	292.00	87.69	1.50	190.50	95.25
∞ ----:		1,000.00			333.00			200.00	

Present Value. Theoretically the present value of any capital
asset is determined by discounting the future income stream. Else-
where in this report some of the problems in applying the discounting
procedure have been considered. In this section various methods of
estimating present value will be considered.

Market Value of Allotments. The most obvious choice for
measurement of value is the price paid to acquire an acre of allot-
ment. This assumes that buyers were in some way able to utilize
the discounting process in establishing a present value for
allotments.

In a competitive market the value established should closely
approximate the true economic value of the allotment. However,
available observations of market value are constrained because
allotment markets are limited to States and counties or non-existent.
The market for allotments for a specific crop is affected by the
existence of other programs which raise the opportunity value of
production of alternative crops. The increment to income from a
single program is less, with other programs in existence, than it would
be if there were only one program.

Market values of allotments may tend to be lower than the oppor-
tunity value because allotments are typically transferred from low
to high productivity areas. Thus market prices may reflect more
of the opportunity value of production to the seller than to the
buyer who may have some surplus that cannot be measured.

Regression Estimates. As an alternative to observing sales of allotments, regression techniques have been used for some commodities to estimate the contribution of an additional acre of allotment to the value of land. These estimates require independence of variables in the equation, some degree of variation of allotments in relation to acreage, and a large number of observations in order to isolate the impact of variations in allotment acreage on land values.

Previous studies in this area have provided little information that can be accepted with any certainty because of the serious intercorrelation problems that exist between variables and the difficulties involved in collection of sufficient data.

Capitalization of Rents. A third alternative for estimating present value is to select a capitalization rate and capitalize the annual rental value of allotments. The capitalization rate may be drawn from observations of other programs or assumed from

alternative investments in financial markets. This method can provide a general idea of the capitalized value, but it precludes the possibility of setting confidence intervals around the estimated value.

We cannot document the true linkage between income and value, but can arrive at an estimate of what that linkage might be by using available empirical data and qualitative judgments of researchers familiar with the problem.

Changes in program benefits as a result of changes in legislation or in administrative interpretation can result in significant shifts in the expectations of allotment owners or potential buyers. Thus, although the overall effect of the program throughout time may be to stabilize income, marginal changes in programs or program administration can cause much uncertainty with respect to program benefits. And as a result the capitalized value of the income stream is affected.

SOME POLICY IMPLICATIONS

This study sheds considerable light on the continuing controversey concerning the allocation of benefits from farm programs. Some believe all goes to the farm operator, others believe it is all capitalized into land values at rates equivalent to long term mortgage rates. This analysis, however, suggests that neither position is correct. It shows very high capitalization rates for land returns from programs and suggest that only part of the benefits are available for capitalization.

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The relatively high capitalization rates shown for cotton can be partly explained by the variability in the cotton program and the relative uncertainty of its continuation. Lower rates for rice and peanuts suggest that the returns from these programs and the programs themselves have been more stable.

Although estimates of capitalized value have been made for wheat and feed grains, the lack of market data on these commodities seriously reduces the quality of the estimates.

In this analysis, we have been largely concerned with the opportunity value of program benefits or the amount farm operators would have paid to acquire these benefits if all investment decisions had been made in 1970. That is, how much would farmers have been willing to pay to purchase the expected income stream from the programs. In a competitive market this value should be equal to the discounted present value of the income stream. However, the market for allotments and program benefits is not fully competitive and there exists some surplus to the buyers of allotments. Thus, to terminate the programs with appropriate compensation, it may require more to buy the benefit stream from all operators than we have estimated.

If farm incomes are to be maintained, it would not be sufficient to purchase only the value of the income stream capitalized into land. Farmers would also need to be compensated for the reduction in earnings of their labor and capital; and the impact here is apparently much more important than commonly thought. That

is, much more of the income stream from programs is used to pay factors other than land and the impact on annual earnings for these factors would be severe.

For most land owners a buyback of the benefit stream would constitute a windfall gain. For a few, the payment would represent the recovery of a capital expenditure. However, for both the value of land would decline.

RECOMMENDATIONS FOR FURTHER ANALYSIS

Research on the market value of transferable allotments offers the highest probability of success with the least research cost. Collection of additional information on rice, cotton and peanut allotment rents and transfers and on rental rates for tobacco would improve estimates of allotment values for these crops. Useful insight into the capitalization process could be developed by research on the attitudes of farmers toward payments and an inquiry into their expectations framework. Do different groups (by age, income, and tenure) have different expectations? In addition, it may be possible to establish differences in expectations by commodities.

Alternative methods of program withdrawal could also be offered for consideration of those interviewed and their responses would shed some light on the value of a buyback proposal. Such analysis should involve a multidisciplinary approach incorporating economic, sociological and anthropological techniques to determine:

1. the market value of allotments for allotment.

2. annual lease rates for allotments.

3. what factors affect operators' and landlords' expectations of income from programs.

4. how income from programs is allocated among the factors of production.

A second research area that could have a high payoff but which would offer less in the way of immediate results would be the development of a model that incorporated State and regional income, resource adjustment, and resource return analyses in a consistent framework. This could be built on the existing Iowa and ERS models. The results of such a model could be valuable for estimating the impact of program changes on incomes and asset values, but would be quite costly to develop and maintain.

Although there is a real need for data on the impact of wheat and feed grain programs on incomes and land values, the current nature of the program offers little hope for precision in estimating their impact.

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Table 11.--Capitalized value of farm program benefits, 1970

State and region	Cotton 1/	Tobacco 2/	Peanuts 3/	Rice 4/	Wheat 5/	Feed grain 5/	Total	
							All programs	As a percentage of real estate value
				1,000 dollars				Percent
Maine----------------	---	---	---	---	14	319	333	0.12
New Hampshire---------	---	---	---	---	---	238	238	.20
Vermont--------------	---	---	---	---	---	819	819	.23
Massachusetts--------	---	---	---	---	---	367	367	.11
Rhode Island---------	---	---	---	---	---	14	14	.03
Connecticut----------	---	---	---	---	. ---	757	757	.19
New York-------------	---	21	---	---	31,276	43,971	75,268	2.76
New Jersey-----------	---	---	---	---	3,748	12,700	16,448	1.80
Pennsylvania---------	---	360	---	---	28,876	61,586	90,822	2.59
Delaware-------------	---	---	---	---	1,800	4,657	6,457	2.14
Maryland-------------	---	---	---	---	9,586	22,105	31,691	1.61
Northeast-----------	---	381	---	---	75,300	147,533	223,214	2.04
Michigan-------------	---	---	---	---	97,557	157,648	255,205	6.40
Wisconsin------------	---	---	---	---	3,129	199,410	202,539	4.68
Minnesota------------	---	336	---	---	72,833	571,605	644,774	9.25
Lake States---------	---	336	---	---	173,519	928,663	1,102,518	7.21
Ohio----------------	---	25,788	---	---	115,705	255,552	397,045	5.94
Indiana-------------	---	43,680	---	---	84,343	408,548	536,571	7.75
Illinois------------	127	9	---	5	128,495	616,038	744,674	5.30
Iowa----------------	---	21	---	---	3,852	1,053,781	1,057,654	7.90
Missouri------------	52,043	7,170	132	1,269	112,124	456,186	628,924	8.60
Corn Belt-----------	52,170	76,668	132	1,274	444,519	2,790,105	3,364,868	6.96
North Dakota---------	---	---	---	---	584,433	156,624	741,057	18.94
South Dakota---------	---	---	---	---	180,219	209,095	389,314	11.06
Nebraska-------------	---	---	---	---	238,714	660,971	899,685	12.79
Kansas--------------	---	168	---	---	700,105	330,662	1,030,935	13.30
Northern Plains-----	---	168	---	---	1,703,471	1,357,352	3,060,991	13.78
Virginia------------	758	242,222	64,217	---	13,614	44,933	365,744	12.49
West Virginia--------	---	6,759	---	---	1,014	4,995	12,768	2.54
North Carolina-------	20,778	1,167,633	125,645	10	22,757	154,119	1,490,942	32.70
Kentucky------------	323	504,765	---	---	11,414	166,262	682,764	18.64
Tennessee-----------	81,340	197,823	748	138	8,805	121,795	410,649	11.33
Appalachian---------	103,199	2,119,202	190,610	148	57,604	492,104	2,962,867	19.39
South Carolina-------	37,696	201,823	1,419	759	11,690	63,748	317,135	17.74
Georgia-------------	38,181	176,889	211,898	---	8,043	159,700	594,711	15.67
Florida-------------	1,584	36,956	16,161	255	705	34,052	89,714	1.66
Alabama-------------	81,359	1,752	39,704	---	2,643	102,333	227,791	8.65
Southeast-----------	158,820	417,421	269,182	1,014	23,081	359,883	1,229,351	9.02
Mississippi---------	218,526	---	908	12,446	2,562	61,114	295,556	7.28
Arkansas------------	151,899	105	507	106,399	5,338	12,762	277,010	6.06
Louisiana-----------	63,040	---	236	126,663	1,643	12,748	204,330	4.36
Delta States--------	433,465	105	1,651	245,508	9,543	86,624	776,896	6.11
Oklahoma------------	23,280	---	34,330	40	330,333	73,095	461,078	7.42
Texas---------------	468,423	---	100,566	112,610	271,743	647,238	1,600,580	7.83
Southern Plains-----	491,703	---	134,896	112,650	602,076	720,333	2,061,658	7.73
Montana-------------	---	---	---	---	325,381	27,257	352,638	9.66
Idaho---------------	---	---	---	---	157,152	10,581	167,733	6.40
Wyoming-------------	---	---	---	---	18,200	4,314	22,514	1.67
Colorado------------	---	---	---	---	146,671	90,219	236,890	7.40
New Mexico----------	21,307	---	3,717	---	40,548	59,533	125,105	6.29
Arizona-------------	77,198	---	255	61	4,167	16,152	97,833	4.32
Utah----------------	---	---	---	---	23,548	4,990	28,538	2.72
Nevada--------------	428	---	---	---	2,205	210	2,843	.60
Mountain------------	98,933	---	3,972	61	717,872	213,256	1,034,094	6.23
Washington----------	---	---	---	---	235,605	8,062	243,667	6.17
Oregon--------------	---	---	---	---	78,262	7,948	86,210	2.83
California----------	165,498	---	311	133,222	28,986	49,443	377,460	1.93
Pacific-------------	165,498	---	311	133,222	342,853	65,453	707,337	2.67
48 States----------	1,503,788	2,614,281	600,754	493,877	4,149,838	7,161,256	16,523,794	7.94

1/ Based on estimates from 1966 Cotton Cost Survey data on transfer prices per pound of allotment.
2/ Per acre values are estimated at $3,000 see Bradford and Thompson (1).
3/ Based on Schools (6), see appendix table.
4/ Based on Grant (2) and Hottel (4).
5/ Direct payments capitalized it 21 percent, the average ratio for cotton.

APPENDIX NO. 2.--SHARE LEASING ARRANGEMENTS

Determination of returns to factors of production in agriculture is complicated by the fact that most individuals own or provide several factors of production. Rates of payment for individual factors are not established on most farms. However, land is frequently rented and cash or share rental arrangements are well established by rental markets and custom. By utilizing rental data, benefits from farm programs accruing to landlords versus tenants can be assessed. The following is a summary of common leasing arrangements on the major crops affected by farm commodity programs in the major production reigons.

Wheat

In the wheat-small grain region in the Northern Plains (North Dakota and Montana) and in the Southern Plains (Kansas) the bulk of the rented land is on a share lease. The most common share lease is 1/3 - 2/3. The landlord receives 1/3 of the crop, and 1/3 of the wheat certificates and land diversion payments. The tenant receives 2/3 of the crop and payments. Both landlord and tenant are eligible for CCC nonrecourse loans on their share of the crop.

Cash leasing is increasing in these areas but is still less common than share leasing. Under a cash lease, all government payments are paid directly to the tenant.

In Kansas, some landlords limit the diversion or set-aside
by the tenant to the minimum necessary to qualify for price
supports. Apparently, landlords believed the tenants were
previously receiving too large a share of the Government payments.

In the more productive areas in the Pacific Northwest (Wash-
ington, Oregon, and Idaho) the most common lease is a share lease
with the landlord receiving 1/3 to 40 percent of the crop and
government payments. In drier areas the landlord share occasionally
drops to 25 percent.

In Texas and Oklahoma, tenants receive 2/3 of the crop and
2/3 of all price supports and/or production control payments.
Lease arrangements have not changed because of programs.

With the exception of a slight increase in the incidence
of cash leasing, no changes in leasing arrangements have resulted
from the introduction of wheat price support programs.

Corn and Soybeans

In the Corn Belt most rented land is leased on a share lease
with the landlord receiving 1/2 of the corn crop and 2/5 to 1/2 of
the soybean crop. All government price supports, income support or
production control payments are shared on the same basis as the
crop. Cash leasing has increased considerably in the last decade
but share leasing is still most common. In Iowa in 1964, 62
percent of rented land was on a crop share basis, 22 percent on
a livestock value basis and 16 percent was cash leased. On cash
leases, since all receipts from the crop and government payments

are paid to the tenant, it is difficult to determine what portion of these benefits is passed on to the landlord in the lease payment.

Cotton

In Arizona and California cash leasing is more common than share leasing. Under cash leases the tenant receives all the crop and payments; under share leases the landlord typically receives 1/4 of the crop and payments. Cotton land is cash leased for a higher rate than for other crop uses.

Evidence indicates that in the absence of farm programs, cash and share rental arrangements would probably change drastically. The share or rate going to the landlord would have to be reduced considerably to permit tenant operated farms to remain economically viable.

In the Southeast (Georgia and the Carolinas) cash leasing is more prevalent than share leasing. Under cash leases when an allotment but no land is leased, the allotment owner is paid 4 to 5 cents per pound (annual basis). The tenant receives all the crop and payments. Payments consist of 15 cents per pound on the domestic allotment. Hence, the allotment owner is receiving nearly 1/3 of the payment. Tenants claim that a portion of this payment is needed to cover production costs. (This implies that production costs are above market or loan prices of cotton.)

Under share lease arrangements in the Southeast, tenants and landlords share the crop 50-50, including all program payments. Under this arrangement the landlord provides both the allotment and the land.

In Texas and the Mississippi Delta both cash and share leasing is observed. A common cash lease rate is 8 cents per pound to the owner of the land and the allotment. Under a share lease, the tenant receives 3/4 of the crop and payments.

Tobacco

In tobacco, prices are supported through Growers Cooperative Associations, commonly called pools, which are financed by CCC. No other Government payments are made to tobacco growers. Tenants and landlords share the crop on a 50-50 basis. It is believed that if support prices were reduced, landlords would have to pay additional costs or accept smaller shares to allow tenants to meet production costs.

Rice

Price supports under the rice program consist entirely of CCC nonrecourse loans on the rice produced with no added income support or diversion payments. Leasing of rice allotments is extremely complex. In some areas rice allotments are attached to the land. In Texas, California, and parts of Louisiana the allotments are

assigned to the farm operator. Hence, they can be held by either tenants or landowners. Program regulations specify that rice allotments can be leased on a share basis but not on a cash basis. Water is also an important input in rice production and is often paid for on a share basis. In Louisiana the owner of the land and allotment typically receives 1/5 of the crop. About 80 percent of the rice acreage in Louisiana is tenant operated.

In California, 38 percent of the producer allotments are leased. Leasing combinations are numerous. Land with no allotment leases for cash or for 1/5 to 1/4 of the crop. If no other inputs are included, allotments lease for 15 percent of the crop. Many other combinations of leasing of land, allotments and other inputs are prevalent. The allotment leased for 15 percent of the crop has a current market value of $400 per acre. Returns to the owner of this allotment would be approximately $41.25 per acre, i.e., 15 percent of 555 cwt. per acre times $5.00 per cwt.

In Texas, allotments are producer-based and leasing is very common. The majority of producers are nonlandowners. Allotments are generally leased for 1/10 to 1/8 of the crop. Most allotments since 1962 have sold for approximately $240 per acre.

Peanuts

Under the peanut program all benefits are derived through the price support program. Share leasing is most common with tenants receiving benefits proportional to the share of the crop they receive. It appears that in the absence of price support payments on peanuts, tenants would have to receive a larger share of the crop to meet production costs.